

## CSE

4 <sup>TH</sup> SEMESTER	COURSE OUTCOMES
<b>Discrete Mathematics (BTCS 401-18) :C230</b>	
C230.1	An ability to express logical sentence in terms of predicates, quantifiers, and logical connectives.
C230.2	An ability to derive the solution for a given problem using deductive logic and prove the solution based on logical inference.
C230.3	An ability to apply knowledge for a given a mathematical problem, classify its algebraic structure.
C230.4	An ability to evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.
C230.5	An ability to develop the given problem as graph networks and solve with techniques of graph theory.

<b>Operating System (BTCS 402-18): C231</b>	
C231.1	Know the roles and responsibilities of an Operating system
C231.2	Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, and Response Time.
C231.3	Develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time for a given specification of memory organization.
C231.4	Design and implement file management system.
C231.5	Develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers for a given I/O device and OS (specify),

<b>Design &amp; Analysis of Algorithms (BTCS 403-18) :C232</b>	
C232.1	Analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
C232.2	Explain when an algorithmic design situation calls for which design paradigm (greedy/ divide and conquer/backtrack etc.)
C232.3	Explain model for a given engineering problem, using tree or graph, and write the corresponding algorithm to solve the problems
C232.4	Demonstrate the ways to analyze approximation/randomized algorithms (expected running time, probability of error)
C232.5	Examine the necessity for NP class-based problems and explain the use of heuristic techniques

<b>Computer Organization &amp; Architecture (BTES401-18) :C233</b>	
C233.1	Understand functional block diagram of microprocessor;
C233.2	Apply instruction set for Writing assembly language programs
C233.3	Design a memory module and analyze its operation by interfacing with the CPU
C233.4	Classify hardwired and micro programmed control units
C233.5	Understand the concept of pipelining and its performance metrics.

<b>Environmental Studies (EVS101-18) :C234</b>	
C234.1	Develop the knowledge on various renewable & non-renewable resources, their causes and their effects.
C234.2	Understand the values, threats and conservation of biodiversity and classify various Ecosystems
C234.3	Identify and implement technological and economical solution to environmental problems.
C234.4	Research on environmental solutions and perform activities to generate public awareness.
C234.5	Imbibe awareness in individuals to conduct activities on social issues, environment awareness campaigns etc.

<b>Universal Human Values (HSMC-122-18) : C235</b>	
C235.1	Comprehend the need of getting value based education in technical and professional institutions.
C235.2	Understand the process and content of self-exploration and natural acceptance and its need in the present scenario.
C235.3	Understand the basic human aspirations and the ways to fulfil these aspirations.
C235.4	Identify the comprehensive human goal for a sustainable happiness and prosperity for all and the state of society and clean environment for the healthy life today.
C235.5	Recognize their role as individual and their responsibility in life towards their own self and towards one's family, society and nature.

<b>Operating System Lab (BTCS-404-18) :C236</b>	
C236.1	Understand and implement basic services and functionalities of the operating system
C236.2	Analyze and simulate CPU Scheduling g Algorithms like FCFS, Round Robin, SJF, and Priority
C236.3	Implement commands on virtual machines for files and directories
C236.4	Compute and implement the concepts of shell programming, files and directories.
C236.5	Simulate file allocation and organization techniques for shell programming
C236.6	Develop the concepts of deadlock in operating systems and implement them in multiprogramming system

<b>Design &amp; Analysis of Algorithms Lab (BTCS-405-18) :C237</b>	
C237.1	Improve practical skills in designing and implementing complex problems with different techniques.
C237.2	Understand comparative performance of strategies and hence choose appropriate, to apply to specific problem definition.
C237.3	Implement Various tree and graph-based algorithms.
C237.4	Familiarization of various algorithms with their design methods.
C237.5	Design and Implement heuristics for real world problems.

<b>Computer Organization &amp; Architecture Lab (BTES 402-18): C238</b>	
C238.1	Understanding computer anatomy - Memory, Ports, Motherboard etc.
C238.2	Prepare and plan to Assemble personal computer
C238.3	Investigate the various assembly language programs for basic arithmetic operations
C238.4	Illustrate the various assembly language programs for basic logical operations
C238.5	Sequence the functioning of microprocessor/microcontroller based systems with I/O interface.

<b>5TH SEMESTER</b>	<b>COURSE OUTCOMES</b>
<b>Database Management Systems (BTCS 501-18) : C321</b>	
C321.1	Write relational algebra expressions for a query and optimize the Developed expressions
C321.2	Design the databases using ER method and normalization.
C321.3	Apply the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2.
C321.4	Determine the storage strategies, transaction atomicity, consistency, isolation, and durability.
C321.5	Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.
C321.6	Implement the database security with different methods.

<b>Formal Language &amp; Automata Theory(BTCS 502-18): C322</b>	
C322.1	Write a formal notation for strings, languages and machines.
C322.2	Design finite automata to accept a set of strings of a language.
C322.3	Design context free grammars to generate strings of context free language
C322.4	Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
C322.5	Distinguish between computability and non-computability and Decidability and undecidability.

<b>Software Engineering (BTCS 503-18): C323</b>	
C323.1	Identify the need for engineering approach to software development and various processes of requirements analysis for software engineering.
C323.2	Analyze various software engineering models and apply methods for design and development of software projects.
C323.3	Work with various techniques, metrics and strategies for Testing software projects.
C323.4	Identify and apply the principles, processes and main knowledge areas for Software Project Management
C323.5	Proficiently apply standards, CASE tools and techniques for engineering software projects
C323.6	Focuses on component based software development.

<b>Computer Networks (BTCS 504-18): C324</b>	
C324.1	Able to define the functions of the different layer of the OSI Protocol
C324.2	Acquire the Knowledge of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
C324.3	Develop the network programming for a given problem related TCP/IP protocol
C324.4	Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.
C324.5	Configure basic concept of cryptography.
C324.6	Develop the transport layer.

<b>Enterprise Resource Planning (BTES 501-18): C325</b>	
C325.1	Know the basics of ERP.
C325.2	Understand the key implementation issues of ERP.
C325.3	Learn the business modules of ERP.
C325.4	Understand the ERP market.
C325.5	Awareness of present and future of ERP.

<b>Web technologies (BTCS 520-18): C326</b>	
C326.1	Understand and apply the knowledge of web technology stack to deploy various web services.
C326.2	Analyze and evaluate web technology components for formulating web related problems.
C326.3	Design and develop interactive client server internet application that accommodates user specific requirements and constraint analysis
C326.4	Program latest web technologies and tools by creating dynamic pages with an understanding of functions and objects
C326.5	Apply advance concepts of web interface and database to build web projects in multidisciplinary environments
C326.6	Able to understand internet addressing, internet connection, web application and tools for web site creation.

<b>Constitution of India (MC ) C327</b>	
C327.1	Impart basic knowledge about the Constitution of India.
C327.2	Educate the students about their obligations, responsibilities, privileges and rights, duties and get insights on administrative and judicial setup of the country.
C327.3	Inculcate national and patriotic spirit among the students as responsible citizens of the country.
C327.4	Impart knowledge about state and central policies, fundamental duties, electoral process, amendment procedure and emergency provisions.
C327.5	Analyze the History, features of Indian constitution, the role Governor and Chief Minister, role of state election commission, the decentralization of power between central, state and local self-government.
C327.6	Apply the knowledge on directive principle of state policy, the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.

<b>Database Management Systems Lab (BTCS 505-18): C328</b>	
C328.1	Retrieve data from relational databases using SQL.
C328.2	Implement generation of tables using data types
C328.3	Design and execute the various data manipulation queries.
C328.4	Learn to execute triggers, cursors, stored procedures etc.
C328.5	Learn to execute recovery tools.
C328.6	Study tools which can help to design database.

<b>Software Engineering Lab (BTCS 506-18) : C329</b>	
C329.1	Design document and test cases.
C329.2	Understand and track the progress of a software project.
C329.3	Design CASE tool.
C329.4	Perform unit testing and integration testing.
C329.5	Execute various white box and black box testing techniques.
C329.6	Prepare Software Configuration Management and Risk Management related documents.

<b>Computer Networks Lab (BTCS 507-18) : C330</b>	
C330.1	Know about the various networking devices, tools and also understand the implementation of network topologies;
C330.2	Create various networking cables and know how to test these cables;
C330.3	Create and configure networks in packet tracer tool using various network devices and topologies;
C330.4	Configure routers using various router configuration commands.
C330.5	Understand IP addressing and configure networks using the subnetting;

<b>Web Technologies Lab (BTCS 522-18) : C331</b>	
C331.1	Learn the basic of HTML elements
C331.2	Understand the basics of PHP Console.
C331.3	Introduce Client side scripting with JavaScript and AJAX.
C331.4	Demonstrate the use of web site designing tools such as Joomla, Word Press
C331.5	Demonstrate the use of Loops and arrays in PHP
C331.6	Understand the basic concept of CSS.

<b>Industrial Training: C332</b>	
C332.1	Acquire knowledge about latest software, hardware and modern engineering tools.
C332.2	Analyse, design and develop solutions for various problems by conducting systematic study of projects.
C332.3	Apply engineering and mathematical concepts for solving problems faced by society and industry.
C332.4	Develop technical interpersonal communicative projects and finance management skills applicable to the industry.
C332.5	Learn moral values such as responsibility, commitment, teamwork spirit and ethics during training and achieve continuous learning.
C332.6	Excel in real work environment and gain knowledge in report writing in technical works/projects.

<b>6TH SEMESTER</b>	<b>COURSE OUTCOMES</b>
<b>Compiler Design (BTCS601-18) :C333</b>	
C333.1	Build concepts on lexical analysis.
C333.2	Understand strategies of syntax analysis.
C333.3	Learn techniques of Intermediate code generation.
C333.4	Understand code design issues and design code generator.
C333.5	Design and develop optimized codes.

<b>Artificial Intelligence (BTCS-602-18): C334</b>	
C334.1	Build intelligent agents for search and games
C334.2	Solve AI problems by learning various algorithms and strategies
C334.3	Understand probability as a tool to handle uncertainty
C334.4	Learning optimization and inference algorithms for model learning
C334.5	Design and develop programs for a reinforcement agent to learn and act in a structured environment

<b>Internet of things (BTCS-608-18) : C335</b>	
C335.1	Understand internet of Things and its hardware and software components
C335.2	Interface I/O devices, sensors & communication modules
C335.3	Remotely monitor data and control devices
C335.4	Develop real life IoT based projects
C335.5	To understand hardware properties

<b>Cloud Computing (BTCS-612-18): C336</b>	
C336.1	Understand the core concepts of the cloud computing paradigm.
C336.2	Understanding importance of virtualization along with their technologies
C336.3	Analyse various cloud computing service and deployment models and apply them to solve problems on the cloud
C336.4	Implementation of various security strategies for different cloud platform
C336.5	Understand security issues in cloud computing

<b>Machine Learning (BTCS-618-18):C337</b>	
C337.1	Differentiate various learning approaches, and to interpret the concepts of learning techniques
C337.2	Analyse and extract features of complex datasets
C337.3	Deploy techniques to comment for the Regression
C337.4	Comprehend and apply different classification and clustering techniques
C337.5	Understand the concept of Neural Networks and Genetic Algorithm

<b>Mobile Application Development (BTCS-620-18): C338</b>	
C338.1	Describe those aspects of mobile programming that make it unique from programming for other platforms
C338.2	Critique mobile applications on their design pros and cons
C338.3	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces
C338.4	Program mobile applications for the Android operating system that use basic and advanced phone features
C338.5	Deploy applications to the Android marketplace for distribution

<b>Wireless Communication (BTEC-601-18):C339</b>	
C339.1	Understand the basic elements of Cellular Radio Systems and its design
C339.2	Learn about the concept's Digital communication through fading multipath channels
C339.3	Understand various Multiple Access techniques for Wireless communication
C339.4	Know about the Wireless standards and systems
C339.5	Implement wireless technologies and their evolution for technological convergence in society

<b>PROJECT-1 (BTCS-603-18): C339</b>	
C339.1	Understand various issues while developing project.
C339.2	Understand strategies of project development.
C339.3	Understand the nature of software development.
C339.4	Know the basics of testing.
C339.5	Understand need of project management.
C339.6	Build and test the project successfully.

<b>Compiler Design Lab(BTCS604-18):C341</b>	
C341.1	Implement the lexical analyze
C341.2	For implementing the functionalities of predictive parser
C341.3	To implement operator precedence parsing.
C341.4	to recognize strings
C341.5	to generate abstract syntax tree

<b>Artificial Intelligence Lab (BTCS-605-18): C342</b>	
C342.1	Build programme to conduct uninformed and informed search
C342.2	Solve AI problems by learning various algorithms and strategies to develop game search
C342.3	Understand and build a Bayesian network from given data
C342.4	Design to infer from the Bayesian network.
C342.5	Develop a programme to run value and policy iteration in a grid world
C342.6	Learning reinforcement in a grid world and build algorithms for model learning

<b>Internet of Things Lab (BTCS-609-18) : C343</b>	
C343.1	Apply the concepts of IOT.
C343.2	Identify the different technology
C343.3	Apply IOT to different applications
C343.4	Analysis and evaluate protocols used in IOT.

<b>Cloud Computing Lab (BTCS-613-18) : C344</b>	
C344.1	Understand the concept of Cloud Computing and different Cloud service along with deployment models
C344.2	Apply Virtualization and Understand the importance of virtualization along with their technologies.
C344.3	Analyze and Evaluate different cloud scheduling algorithms
C344.4	Analyze the components of Cloud platform and understand its simulation using different simulators
C344.5	Describe the key components of Amazon web Service and other cloud service providers

<b>Machine Learning Lab (BTCS-619-18): C345</b>	
C345.1	Understand the implementation procedures for the machine learning algorithms
C345.2	Apply appropriate data sets to the Machine Learning algorithms.
C345.3	Identify and apply Machine Learning algorithms to solve real world problems.
C345.4	Analyze and identify the need for machine learning techniques for a particular domain
C345.5	Illustrate how the mathematical objects - linear algebra, probability, and calculus can be used to design machine learning algorithms

<b>Mobile Application Development Lab (BTCS 621-18) : C346</b>	
C346.1	Understand the android platform, tools and app idea.
C346.2	Set up mobile app development environment
C346.3	Learn emulator to deploy and run mobile app
C346.4	Deploy applications to the Android marketplace for distribution
C346.5	Develop and debug mobile app components

<b>7TH SEMESTER</b>	<b>COURSE OUTCOMES</b>
<b>Adhoc and Wireless Sensor Networks (BTCS-716-18) :C414</b>	
C414.1	Explain the Fundamental Concepts and applications of ad hoc and wireless sensor networks and apply this knowledge to identify the suitable routing algorithm based on the network.
C414.2	Apply the knowledge to identify appropriate physical and MAC layer protocols
C414.3	Understand the transport layer and Describe routing protocols for ad hoc wireless networks with respect to TCP design issues
C414.4	Be familiar with the OS used in Wireless Sensor Networks and build basic modules
C414.5	Understand the Challenges in security provisioning ,Security Attacks and security issues possible in Adhoc and Sensors Networks

<b>Network Security and Cryptography (BTCS-701-18) :C410</b>	
C410.1	Understand the fundamental principles of access control models and techniques, authentication and secure system design.
C410.2	Have a strong understanding of different cryptographic protocols and techniques and be able to use them.
C410.3	Apply methods for content integrity, authentication, and access control.
C410.4	Identify and mitigate software security vulnerabilities in existing systems.
C410.5	To develop an understanding of security policies and apply methods of Intrusion detection and Prevention.

<b>Agile Software Development(BTCS BTCS 710-18) :C413</b>	
C413.1	Understand concept of agile software engineering and its advantages in software development.
C413.2	Explain the role of design principles in agile software design.
C413.3	Define the core practices behind Scrum framework.
C413.4	Understand key principles of agile software development methodology-Kanban.
C413.5	Define the principles, roles, tools and practices for Extreme programming.
C413.6	Describe implications of testing, integration, factoring and tools available to agile teams to test the project.

<b>Data Mining and Data Warehousing:(BTCS 702-18) : C411</b>	
C411.1	To introduce students to the basic concepts and techniques of Data Mining
C411.2	To introduce a wide range of clustering, estimation, prediction, and classification algorithms
C411.3	To introduce mathematical statistics foundations of the Data Mining Algorithms
C411.4	To introduce basic principles, concepts and applications of data warehousing

<b>Routing and Switching: (BTEC 905A-18):C412</b>	
C412.1	Demonstrate a basic understanding of small and medium-sized networks, including general network technologies.
C412.2	Ability to assist the design of small and medium-sized networks, and implement the designs.
C412.3	Understand the storage technologies into their networks in order to support a variety of applications.
C412.4	Ability to construct simple networks and integrate voice, wireless, cloud, security.

<b>Project-II : (BTCS 703-18): C415</b>	
C415.1	Understand how to apply software development methodology on application development.
C415.2	To Acquire knowledge about advance programming languages and techniques.
C415.3	Learn to identify and solve real world problems.
C415.4	Understands how to write technical report.
C415.5	Learn to generate Test cases and to perform software Testing.
C415.6	Understand the security aspects and backup recovery

<b>Agile Software Development Lab (BTCS BTCS 711-18) :C416</b>	
C416.1	Understand the background and driving forces for taking an Agile Approach to Software Development.
C416.2	Build out a backlog and user stories
C416.3	Study various automated tools.
C416.4	Apply Design principle and Refactoring to achieve agility.
C416.5	Learn Testing activities within an agile project

<b>Adhoc and Wireless Sensor Networks Lab (BTCS-717-18) : C417</b>	
C417.1	Understand the principles of Wireless sensor networks and to perform its simulation.
C417.2	To implement routing protocols using networking tools.
C417.3	To identify and study the methodology of various wireless network simulators.
C417.4	Understand the Challenges in security provisioning of routing protocols.

<b>8TH SEMESTER</b>	<b>COURSE OUTCOMES</b>
<b>Semester Training:(BTCS 801-18) C418</b>	
C418.1	Understand the use software's on application development.
C418.2	Acquire knowledge about advance programming techniques and modern tools.
C418.3	Learn to identify and solve real world problems.
C418.4	Able to use latest technologies for computer algorithms like machine learning, Artificial intelligence, data science